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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/963,637	09/27/2001	Gary A. Brist	219 40432X00	9725

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ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 NORTH SEVENTEENTH STREET
SUITE 1800
ARLINGTON, VA 22209-9889

EXAMINER

PAK, SUNG H

ART UNIT PAPER NUMBER

2874

DATE MAILED: 08/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/963,637

Applicant(s)

BRIST ET AL.

Examiner

Sung H. Pak

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 and 21-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 and 21-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Applicants' amendment filed 5/28/2003 has been entered, and the arguments regarding the patentability of the pending claims have been carefully considered by the examiner. After a thorough reconsideration, the examiner respectfully disagrees with the arguments set forth by the applicants and maintains the ground of rejection established in the prior office action. Please see Remarks for further details.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Collins et al ("Technique for micro-machining millimeter-wave rectangular waveguide") as discussed in the prior office action.

Collins et al reference was cited in the information disclosure statement.

Collins et al reference discloses a method of forming a waveguide with all the limitations set forth in the claims including: forming a trench by selectively removing portion of the substrate (Fig. 1-b) in re claims 1, 4; providing metalized surface along bottom and two side surfaces along the trench (Fig. 1-c, pg. 996) in re claim 5; applying a bonding surface having a metalized capping surface to the substrate such that metalized surface is located over the trench (Fig. 1-d) in re claim 6-7.

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Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2, 8-19, 21-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Collins et al as applied above, in view of Kronz et al (US 6,185,354 B1) as discussed in the prior office action.

Kronz et al reference was cited in the information disclosure statement.

Collins et al reference as applied above, discloses a method with all the limitations set forth in the claims except it does not explicitly disclose the use of printed circuit board substrate and filled waveguide channel. Specifically Collins et al discloses forming a trench on a substrate by removing portions of the substrate (as applied

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above) in re claims 9, 11, 12, 17, 22; forming metalized bottom and two side surfaces (as applied above) in re claims 10, 18-19, 23-25; forming a top metalized surface over the trench by affixing a metalized capping surface over the trench (as applied above) in re claims 13-15, 25.

On the other hand, Kronz et al discloses a method of forming a waveguide in a printed circuit board wherein integral waveguide is formed on a printed circuit board, in which the waveguide is surrounded by metallic layers (Fig. 1, abstract). Kronz et al teaches that such configuration is advantageous because it allow for integration of optical waveguide into a printed circuit board and facilitates impedance matching of intraboard signals (column 2 lines 7-11). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Collins et al device to have filled waveguide formed on a printed circuit board.

Remarks

Rejection of claims 1 and 3-7 under 35 USC 102(b):

Starting on page 6 of the applicants' response, it is argued that Collins reference does not teach the "bonding surface having a metalized capping surface," and that Collins only discloses a "pre-sputtered lid."

The examiner respectfully points out that the "pre-sputtered lid" comprises a sputtered metal layer, which may be called a "capping surface", and a top substrate, which may be called a "bonding surface" since the metal layer is bonded to this

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substrate and the lower substrate containing a waveguide trench is further bonded to the top substrate.

In accordance with MPEP section 2111, the pending claims must be given their broadest reasonable interpretation. Although Collins reference does not explicitly use the phases, "capping surface" and "bonding surface" in its disclosure, the claimed subject matter fully reads on the Collins reference when the claims are given their broadest reasonable interpretation. In re Prater, The court stated that "reading a claim in light of the specification, to thereby interpret limitations explicitly recited in the claim, is a quite different thing from reading limitations of the specification into a claim,' to thereby narrow the scope of the claim by implicitly adding disclosed limitations which have no express basis in the claim." In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550- 51 (CCPA 1969). Also see MPEP section 2111. If the applicants wish to give any additional structural specificity to the pending claims, the claims should be amended to recite such features. Therefore, the examiner respectfully points out that the claims, as currently recited, are fully anticipated by Collins reference as discussed in the rejection.

Rejection of claims 2 and 8-26 under 35 USC 103(a):

Starting on page 7 of the applicants' response, it is argued that "there is no suggestion of how to combine Collins and Kronz as alleged in the Office Action." Further, applicants argue that Collins and Kronz devices are directed to a separate methodology of how to form waveguides.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

The examiner respectfully points out these factual inquiries were sufficiently set forth in the Office Action. i.e.: the Office Action 1) "determined the scope and contents of the prior art" and showed how Collins reference disclosed claimed subject matters, 2) "ascertained the differences between the prior art and the claims at issue" by explaining that Collins reference discloses all the limitations of the claimed invention except for the device substrate being a printed circuit board, and 3) "resolved the level of ordinary skill" in the optical waveguide device art.

The examiner respectfully points out that, "in considering objective evidence present in the application indicating obviousness," the Office Action established a prima facie case of obviousness, which is maintained through out the prosecution. As discussed in the rejection, there is a desire and motivation to modify the reference, wherein the prior art references teach all the claimed limitations. The applicants submit evidence of nonobviousness by arguing that there is no reasonable expectation of success, in that Kronz reference teaches formation of a waveguide employing a different methodology than that disclosed in Collins reference, and that there is no suggestion how these devices may be combined.

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The examiner respectfully argues that Kronz reference teaches many different features and elements of a waveguiding device. A person of ordinary skill in the art would not take and incorporate every single features and elements of the Kronz invention into a prior art device. Collins reference teaches a device with all the limitations set forth in the claims except it does not explicitly teach that the substrate used is a printed circuit board. However, Collins device cannot be used in a vacuum. Although Collins discloses that this waveguiding device could be used in variety of applications such as automotive radar, passive imaging and remote sensing, it is silent as to any specific implementations. Mean while, Kronz reference explicitly teaches that a hollow waveguide can be used to transmit electromagnetic signals between different circuit boards (abstract and column 1 lines 35-37). Kronz further teaches that the use of a hollow waveguide yields advantages over the prior art (column 2 lines 7-11). Based on such a disclosure, it would be obvious to a person of ordinary skill in the art at the time the invention was made, to modify Collins device to use the hollow waveguide structure in printed circuit boards. Although Kronz reference goes on to disclose many different elements and features of a specific waveguide embodiment, a person of ordinary skill in the art would not incorporate these inventive concepts into the prior art device. More important, incorporating the specific embodiments of the Kronz device is not necessary to render the claimed limitations obvious.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning (page 9), it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction

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based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Regarding claims 9 and 17, the applicants argue that Collins reference does not disclose "forming a top surface... different than at least one surface." The examiner respectfully points out that Collins teaches attaching a lid over the bottom substrate, such that the top surface is not integrally formed with the bottom surface. As such, the top surface is difference than the surfaces comprising the waveguiding trench (two sides and bottom surfaces). Therefore, the rejection is still proper.

Regarding claim 22, (and in addition claims 28, 30, 32, 34) the applicants argue that Collins does not teach any bonding material. However, Collins explicitly teaches that the top substrate is attached over the bottom substrate to complete the waveguide structure. The attachment of the waveguide substrates is typically accomplished via bonding materials such as epoxy or other adhesives disposed on a predetermined bonding area of the top substrate. Therefore the limitations of claim 22 (and claims 28, 30, 32, 34) regarding the bonding material is inherently disclosed in the Collins reference, and the rejection is proper.

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Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sung H. Pak whose telephone number is (703) 308-4880. The examiner can normally be reached on Monday - Thursday : 6:30am-5:00pm.

The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7724 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

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Sung H. Pak
Examiner
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sp
August 11, 2003

A handwritten signature in black ink, appearing to be 'S. H. Pak'.